Pattern Mining in Sentinel 2B Satellite Images Using the Knime Analytics Platform

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SUMMARY

In this article we present a land use patterns and land cover mining tool designed to intelligently manage knowledge from Sentinel 2B series satellite image data. This tool uses integrated plugins in Knime Analytics Platform. The work was elaborated on Knime platform through the selection of configured and connected nodes and plugins constituting a workflow composing all the methodological phases in order to produce results of each of the process steps with the application of numerous multispectral image processing techniques such as as: preprocessing activities (preparation of image data); image segmentation; application of digital filters; pattern classification; pattern mining and visualization. The input data consisted of hundreds of small multispectral images, color compositions, obtained by cropping a set of images containing 10 spectral bands with spatial resolutions of 10m and 20m from the MSI sensor aboard the Sentinel 2B satellite. This tool is expressed in the form of a workflow that contains each of the phases required for pattern mining, requires no knowledge of programming languages, and is based on the connection of plugins configurable according to the purpose of processing. Connected to each other, these plugins allow you to receive different configurations and defined the methodology workflow in the main phases: loading and viewing images; feature extraction which consisted of extracting from each image a non-redundant numerical vector that characterizes land use and land cover; the creation of attributes for each target (land use class and land cover; testing phase and predictive model evaluation. At the end of the processing, patterns were extracted and these could be filtered using regular expressions and the patterns could be presented. defined on the original images in order to assist intelligent knowledge management.

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